Case report: Midgut malrotation with faecolith - A rare cause of small bowel obstruction in an adult
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Section: Abdominal imaging
Area of Interest: Anatomy Abdomen
Procedure: Education
Imaging Technique: CT
Special Focus: Obstruction / Occlusion Case Type:
Clinical Cases
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Patient: 62 years, male

Clinical History:

The patient presented with a 3-day history of acute, severe and progressive colicky epigastric pain with bilious vomiting and abdominal distension. On clinical examination, he was pyrexial with rigors and demonstrated maximal tenderness at the epigastrium. Laboratory tests revealed raised inflammatory markers with a neutrophil predominance.

Imaging Findings:

An initial non-contrast abdominal/pelvic CT was performed due to the provisional diagnoses of perforated peptic ulcer and pancreatitis. The results of this study demonstrated the caecum dislocated on the left of the abdomen indicative of intestinal malrotation of the midgut [Fig. 3]. The CT also showed a faecolith impacting into an abnormal area of narrowing in the small bowel proximal to the abnormally located ileocaecal junction [Figs. 1, 4]. This small bowel segment was twisting around the root of the mesentery demonstrating the typical “whirlpool sign” [Fig. 2]. Moderate free fluid in the right para-colic gutter was identified. The study also incidentally showed a small lesion in the left renal upper pole.

Discussion:

Intestinal malrotation refers to any deviation in the rotation of the primitive intestinal loop around the superior mesenteric artery (SMA) axis during embryonic development, leading to an abnormally shortened mesenteric root and predisposing the small bowel to midgut volvulus and obstruction [1]. A faecolith is an extremely rare form of impaction, and refers to a laminated mass of accumulated, hardened faecal material that is separate from other bowel contents [2]. Faecoliths are usually localised in the rectosigmoid area, and rarely in the small bowel. They have been described in association with Hirschsprung’s disease, neoplastic and inflammatory diseases, and habitual constipation [2].

Midgut malrotation commonly presents in the neonatal period. Making a clinical diagnosis in adults is challenging due to its uncommon presentation at this age and non-specific symptoms (episodic abdominal pain, vomiting), and consequently the suspicion is seldom considered [3]. The clinical presentation of faecoliths which generally impact the colon is usually nonspecific (constipation, abdominal discomfort), and if untreated, may lead to intestinal obstruction with stercoral ulcers and perforation. The diagnosis is usually made radiologically when the characteristic intraluminal mass suggestive of laminar components
with faecal impaction is noted on plain radiography, barium enema, or CT [2]. Imaging modalities to evaluate suspected malrotation include plain radiography, ultrasonography, upper gastrointestinal (GI) contrast series, and CT. Upper GI barium series remains the gold standard for malrotation in paediatrics [4], of which it would exhibit the abnormal location of the jejunal junction inferior to the duodenal bulb. CT is the preferred diagnostic method in older patients presenting acutely [5]. In addition to demonstrating intestinal malpositioning, CT displays extra-intestinal findings including anomalies in the relationship between the SMA and superior mesenteric vein [1].

Regardless of age, surgical correction in the form of Ladd’s procedure is advocated for intestinal malrotation. Conservative methods including gastrointestinal decompression is usually unsuccessful in faecolith-related small bowel obstruction [6], and laparotomy is often warranted to resolve the obstruction, with enterotomy or bowel resection if appropriate [7]. In light of our radiological findings, laparotomy was performed confirming intestinal malrotation, with a small area of small bowel ischaemia. Ladd’s procedure was performed with untwisting of bowel and cæcopicexy. The patient successfully recovered.

Bowel obstruction secondary to malrotation with faecolith is a surgical emergency that necessitates prompt recognition. It is critical that adult patients who present acutely with vague abdominal symptoms receive rapid radiologic imaging to allow for prompt diagnosis and directed management approach, crucial to prevent life-threatening complications.

**Differential Diagnosis List:** Small bowel obstruction from intestinal malrotation with faecolith. Incidental renal mass., Pancreatitis, Perforated peptic ulcer

**Final Diagnosis:** Small bowel obstruction from intestinal malrotation with faecolith. Incidental renal mass.

**References:**


**Description:** Axial CT abdomen showing a faecolith impacting into an abnormal area of narrowing in the small bowel proximal to the abnormally located ileocaecal junction. **Origin:** Department of Radiology, University Hospital of North Tees, Stockton on Tees, Durham, United Kingdom.
Description: Axial CT abdomen demonstrating the 'whirlpool' sign. Origin: Department of Radiology, University Hospital of North Tees, Stockton on Tees, Durham, United Kingdom.
Figure 3

Description: CT with 3-D reconstruction abdomen and pelvis demonstrating the position of the faecolith. Origin: Department of Radiology, University Hospital of North Tees, Stockton on Tees, Durham, United Kingdom.
Description: Coronal CT image demonstrating the location of the faecolith. Origin: Department of Radiology, University Hospital of North Tees, Stockton on Tees, Durham, United Kingdom.
**Figure 5**

**Description:** Axial CT abdomen demonstrating the caecum (white arrow) and ileocaecal junction to be abnormally located in the left side of the abdomen. **Origin:** Department of Radiology, University Hospital of North Tees, Stockton on Tees, Durham, United Kingdom.